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QUARKONIUM AT FINITE TEMPERATURE *

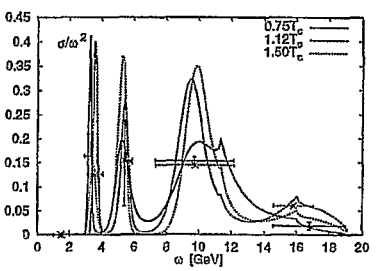
P. PETRECZKY †

Physics Department, Brookhaven National Laboratory, Upton, NY 11973, USA

I discuss quarkonium spectral functions at finite temperature reconstructed using the Maximum Entropy Method. I show in particular that the J/ψ survives in the deconfined phase up to $1.5T_c$

The study of quarkonium system at finite temperature has been a subject of considerable interest since the work of Matusi and Satz [1], but a first principle calculation of quarkonium properties at non-zero temperature was missing. It was shown, however, that the application of the Maximum Entropy Method (MEM) can make such calculation possible [2]. The method have been successfully applied at zero [2] as well as at finite temperature [3].

I am going to discuss charmonium spectral function calculated with MEM on $48^3 \times N_\tau$ lattices at lattice spacing $a^{-1} = 4.86GeV$ and $N_\tau = 24, 16$ and 12 corresponding to temperatures $0.75T_c$, $1.12T_c$ and $1.5T_c$ (T_c being the deconfinement temperature). The results for the vector channel are shown in the Figure. As one can see the J/ψ seems to survive up to temperatures $1.5T_c$. Similar calculation have been performed in the scalar and axial vector channels which correspond to the P-state charmonia, but no peak was found there.



References

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2. M. Asakawa et al, Prog. Part. Nucl. Phys. **46** (2001) 459
3. F. Karsch et al, Phys. Lett. **B530** (2002) 147; S. Datta et al, hep-lat/0208012; M. Asakawa and T. Hatsuda, hep-lat/0308034

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